

PROJECT TITLE : PROTAGORAS
PERIOD COVERED : JANUARY 1981
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OPTIMIZATION OF PROTEIN EXTRACTION

In order to optimize the extraction of proteins from tobacco the influence of the following parameters have been tested : pH, temperature of extraction, time of extraction, and quantity of enzymes used. In each trial only one parameter was changed using the following basic conditions :

Tobacco : 20g B - Blend, Project Spotless
Water : 200 ml
Enzyme : Pronase (Boehringer)
Enzyme quantity : 150 mg
pH : 7.5
Temperature : 37°C
Time : 6 hours

pH

The optimal activity of the pronase lies between pH 6.8 and 8.3. At lower pH levels less proteins are extracted. At higher pH levels the activity of the enzyme decreased. At pH levels of around 10, more proteins were extracted than at pH 7.5, due to a chemical hydrolysis and not to a higher enzyme activity (1).

Enzyme Quantity

Without enzyme, 33% of the tobacco proteins were extracted. This value increases to 65%, if 150 mg pronase are used. Higher amounts of pronase do not improve the result. Lower quantities give a less efficient protein extraction (2).

Temperature of Extraction

The optimal extraction temperature lies between 37°C and 50°C. Higher or lower temperatures result in a less efficient protein extraction (3).

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Time of Extraction

Initially the 6 hours of extraction were chosen arbitrarily. Trials showed that higher extraction times do not improve the result. The extraction time may even be reduced to 3 hours without any loss of efficiency (4).

REFERENCES

1. A. Hänggi - Notebook 79 1201, 33 - 36
2. A. Hänggi - Notebook 79 1201, 39
3. A. Hänggi - Notebook 79 1201, 37
4. A. Hänggi - Notebook 79 1201, 38 - 40

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